Statement of Work (SOW)

1.0 GENERAL

1.1 Requiring Office: Federal Aviation Administration (FAA), Information Technology Staff, AJF-F,

1.1.1 Task Name: VAX to UNIX Connectivity end-to-end Solution

1.1.2 Performance Time: To be completed no later than September 30, 2009.

1.1.2.1 Basic Deliverables: under two (2) separate invoices as per Paragraph 1.5 of this SOW.
1.1.2.1.1 Project Plan detailing milestones, tasks, and schedule of project.
1.1.2.1.2 Reports, software code, or patches that provide end-to-end solution that enables connectivity between VAX 4300 and Unix Oracle Databases defined under paragraphs 8.2 through 8.8.

1.1.3 FAA Contracting Officer's Representative (COR) and Technical Representative:

1.1.3.1 Primary COR for this task:

Jackie Seaman
Resource Staff, AJF-14
Operating Budgets Office
Mike Monroney Aeronautical Center
Oklahoma City, OK 73125
(405) 954-7881

1.1.3.2 Technical Representative for this task

Kathe Milstein
Information and Technology Staff, AJF-A7
ATO Information Technology Office
Silver Spring, MD 20910
301-713-2916 x161

1.2 **Scope of Work**: The contractor shall furnish a solution to facilitate communication between a COBOL application running on a VAX 4300 to Oracle 10g on Solaris 9. The solution will be compatible with Solaris 10 as migration to Solaris 10 is in progress. The communication will allow read, write, update, and delete via SQL from the COBOL code to Oracle 10g. The contractor shall modify COBOL programs to 'redirect' the execution of various read, write, update, and delete SQL commands from an Ingress database to Oracle 10g. The expected results of the programs shall match the existing outputs of the system running against Ingress.

The contractor shall participate in weekly progress and status meetings and document open action items, closed actions items, new action items, cumulative accomplishments, weekly activities, future plans and objectives, outstanding and critical issues along with any other pertinent data. The contractor shall develop deliverables in accordance with paragraph 5 and 8 of this SOW.

1.3 **Personnel Qualifications**: Contractor personnel providing the required services shall have extensive knowledge of COBOL software running on VAX 4300 systems. In addition, contractor personnel shall have extensive knowledge of Oracle 10g, Solaris 9 & 10, COBOL, and SQL. Additionally, the contractor must provide skills to understand, coordinate, and deliver a Project Plan to the COR and Technical Representative.

1.4 **Work Location**: Contractor services for this task shall be primarily performed at ATO-F Offices in Silver Spring, MD with some services to be accomplished at the contractor's facility as deemed appropriate.

1.5 **Invoice Procedures**: This SOW defines provisions for the contractor to issue two (2) firm-fixed priced invoices during the execution of the contract. The contractor may issue the first invoice after delivery, review, and acceptance by the COR of the project plan identified in paragraph 8.1. The contractor may issue the second invoice only after delivery, review, and acceptance of all the deliverables defined in paragraphs 8.2 through 8.8. As part of the project plan, the deliverables in paragraphs 8.2 through 8.8 may be delivered, reviewed, and accepted by the COR in planned intervals but the contractor can only issue the second invoice following the acceptance of all deliverables.

1.5.1 **Invoice 1**: Firm-Fixed Price – Project Plan Also called Delivery 1.
1.5.1.1 **Plan must contain major milestones, tasks to complete milestones, (minimum identification of deliverables in par.** 8.2 through 8.8), a schedule, and a risk list.
1.5.2 **Invoice 2**: Firm-Fixed Price - All other deliverables Also called Delivery 2.
1.5.2.1 **Invoice will show a list of deliverables with one firm**-fixed price.

2.0 DEFINITION OF TERMS:

Unless otherwise defined in this SOW, all terms and conditions shall be defined in the Contract.

2.1 AIS – Aeronautical Information System
2.2 ATO – Air Traffic Organization
2.3 AIS – Aeronautical Information System
2.4 CO – Contracting Officer
2.5 DACS6 – Digital Aeronautical Charting Supplement – 6th file: Contains STARS Data
2.6 DACS7 - Digital Aeronautical Charting Supplement – 7th file: Contains SIDS Data
2.7 DAFIF – Digital Aeronautical Flight Information File
2.8 DP – Departure Procedure
2.9 ERD-Entity Relationship Diagram
2.10 SIDS – Standard Instrument Departure
2.11 STARS – Standard Terminal Arrival Route
2.12 SOW – Statement of Work

3.0 GOVERNMENT FURNISHED PROPERTY AND SERVICES

The Government will provide access to adequate and necessary workspace including basic office equipment, utilities, telephone, and related services when performance is required at a Government facility for up to two contract persons during the time of execution. The FAA shall provide functional and operational access to existing materials that may facilitate the completion of this project in accordance with applicable contract terms.

The FAA shall provide an ERD to the contractor of the data model in Oracle. This shall serve as an aid in the design and construction phases of the project. The FAA shall also provide the source code for the COBOL programs that to be modified.

4.0 CONTRACTOR FURNISHED PROPERTY AND SERVICES

4.1 The contractor shall provide qualified personnel, facilities, related equipment, supplies, and services necessary for performance of this SOW.

4.2 The contractor shall develop all artifacts and documentation as defined by this SOW. Acceptance is contingent on compatibility of the deliverables with FAA standards. Should the FAA change criteria or standards as defined and documented, the contractor will be notified, in writing, of such change(s) so that any modifications to deliverables can be appropriately updated. Modifications to deliverables not approved by the appropriate FAA/AVN personnel and procedures shall be at the contractor's expense.

5.0 REQUIRED TASKS:

5.1 The contractor shall install and configure the solution onto FAA servers that will facilitate the communication between the VAX 4300 and Oracle 10g running on Solaris 9 and Solaris 10.

5.2 The contractor shall modify multiple COBOL programs to 'redirect' communication to the Oracle 10g database to read, write, update, and delete data to accomplish identical outputs and outcomes of the existing COBOL programs running against an Ingres Database on an Alpha environment.

5.3 The contractor shall produce solution and system design documentation that will communicate how the target issues are resolved.

5.4 The contractor shall produce technical integration documentation between the legacy COBOL programs and the vendor provided solution.

6.0 REPORTS

6.1 The contractor will be required to submit progress reports bi-weekly to the COR and the technical representative. The reports shall outline milestones completed and percent of contract completed as designated in the plan submitted as per paragraph 8.1 of the SOW. The report will identify whether the project is on time per the estimated project plan milestone completion dates and include possible risks and risks encountered during each bi-weekly period.

6.2 The contractor, as requested by the COR, shall accomplish mission critical reports. Mission critical is defined as reporting items that have an impact on schedule or the overall accomplishment of tasks delineated by this SOW.

7.0 REGULATIONS AND MANUALS

Performance under this task requires the contractor to adhere to all applicable FAA procedures and guidelines regarding security, facility access, and conduct.

8.0 SPECIFICATIONS / DELIVERABLES

BASIC: Tasks 8.1– 8.8 – A questions and answers document is available along with detailed specifications for tasks 8.3 through 8.7 as indicated in Appendix A of this SOW. The documents are designed to assist vendors in responding to a RFP. Vendors are instructed to review the Task8_(x)README.doc files for details about other files under tasks 8.3 through 8.7.

8.1 **A Project Plan.** The contractor shall deliver a project plan within 30 days following contract award. An additional copy of the project plan shall be delivered to the technical representative prior to project execution. The project plan shall detail tasks, task durations, task dependencies, and the dates of all the deliverables under paragraph in 1.1.2 of this SOW.

8.2 **A System Design Document.** The contractor shall deliver to the COR and technical representative, a system design document that describes how the contractors system solution was implemented and deployed. The design document shall contain enough information to ensure the FAA can adequately maintain any components, code, middleware, licensing, configuration or any other relevant system requirements.

8.3 **SIDS and STARS Discrepancy Report 1.** The contractor shall produce a report that identifies the difference between the SIDS and STARS procedure names stored as a flat file on the VAX 4300, SIDS and STARS procedure names in AIS tables in Oracle (UNIX), and the SIDS and STARS procedure

names in the IAP tables in the Oracle database (UNIX). The FAA will use the report to update procedure name information on the VAX 4300.

8.4 **SIDS and STARS Discrepancy Report 2.** The contractor shall produce a report that identifies the difference between the SIDS and STARS procedure names stored in the IAP tables, versus the SIDS and STARS procedure names stored in the DAFIF7 tables in the Oracle database (UNIX). The FAA will use the report to update procedure name information on the IAP tables in Oracle.

8.5 **Code to update Oracle AIS tables.** The contractor shall delivery new or modified COBOL code to update the Oracle AIS tables with route ID, sequence number, procedure name, and transition points from the DP4.dat and STARS4.dat flat files.

8.6 **Code to Populate AIS Departure and Arrival tables.** The contractor shall delivery new or modified COBOL code to populate the AIS Departure and Arrival DACS Oracle tables with composite arrival and departure data retrieved from various other AIS tables in the Oracle database.

8.7 **Code to Create the DACS6 (STARS), and DACS 7 (SIDS) tables.** The contractor shall new or modified COBOL code that creates the DACS6 and DACS7 Aeronautical products from the AIS Departure and Arrival DACS tables populated in deliverable 8.6.

8.8 **Complete a briefing for FAA Personnel.** The contractor shall conduct a briefing following the delivery of 8.1-8.7. The target audience for the briefing shall include but is not limited to the COR, Technical Representative, and any other relevant stakeholders deemed appropriate by the FAA. The briefing shall illustrate how the contractor met the contract deliverables over the period-of-time specified. The contractor shall develop a document that contains a signature block to illustrate delivery and acceptance of all deliverables defined in paragraphs 8.2 through 8.8. The document must be signed by the technical representative to illustrate the all deliverables have been completed and accepted by the technical representative. Note: The acceptance by the technical representative is not an alternative to Contract Deliverable acceptance by the COR. This document is to be used as proof that both the contractor and technical representative agree that deliverables have been met.

9.0 **Travel:** Travel costs associated with this effort are not billable to the FAA as a separate invoice. Therefore, the contractor must include such costs as part of their firm-fixed price proposal and agreement.

10.0 **Training:** The contractor is obligated to ensure that personnel have adequate training to meet the requirements of this SOW. The FAA is not responsible for training and the contractor shall provide such training at their expense and therefore should take the necessary actions to ensure that the cost of keeping personnel adequately trained is included in costs associated with this contract.

Appendix A

Q&A document	Reference RFQuestionsAnswers.doc
Task 8.1	No supplemental information is necessary or available
Task 8.2	No supplemental information is necessary or available
Task 8.3	Reference TASK8_3.zip – 11 files
Task 8.4	Reference TASK8_4.zip – 12 files
Task 8.5	Reference TASK8_5.zip – 10 files
Task 8.6	Reference TASK8_6.zip – 6 files
Task 8.7	Reference TASK8_7.zip – 8 files
Task 8.8	No supplemental information is necessary or available

Task 8.3 Readme.doc

This document will describe what files, programs, tables and other relevant information are required to understand the deliverable for paragraph 8.3 of the VAX to Unix SOW. The zip file contains a description of the table structures for the CARS application for both the Ingres and Oracle databases. Copies of the COBOL programs are included as well as input data files and output files.

1. SS_MATCH_STAPT_ING.COM - a VAX DCL Command Procedure

This Command Procedure runs to following COBOL programs to compare AIS SID/STAR names to IAP SID/STAR names in the IAP iap_sid and iap_star tables. The procedure compares the AIS AFDSS names for all SIDS and STARS in the SIDS2.DAT file and/or the STARS2.DAT file. Any unmatched names are written to the screen and to a report.

COBOL Programs: **SID_MATCH_STAPT_ING.SCB**
STAR_MATCH_STAPT_ING.SCB

2. SID_MATCH_STAPT_ING.SCB

Inputs:

- **AFDSS.DAT**
- **DP2.DAT**

Outputs:

- **DP_APT_MATCH.RPT**

Tables Accessed:

- iap_airport
- iap_city
- iap_sidapt
- iap_statename_rpt
- ais_profile_descents
- iap_sid
- ais_sd_name
- ais_sd_stapt
- ais_ss_name
- ais_ss_stapt

3. STAR_MATCH_STAPT_ING.SCB

Inputs:

- **AFDSS.DAT**
- **STARS2.DAT**

Outputs

- **STARS_APT_MATCH.RPT**

Tables Accessed:

- iap_airport
- iap_city

- iap_starapt
- iap_statename_rpt
- ais_profile_descents
- iap_star
- ais_ss_name
- ais_ss_stapt

4. Data Structures

Data structures for these tables in Ingres can be found in the file **CARS_TABLE_STRUCTURES_INGRES.DAT** and for Oracle **CARS_TABLE_STRUCTURES_ORACLE.**

Task 8.4 Readme.doc

This document will describe what files, programs, tables and other relevant information required to understand the deliverable for paragraph 8.4 of the VAX to Unix SOW. The zip file contains a description of the table structures for the CARS application for both the Ingres and Oracle databases. Copies of the COBOL programs are included as well as input data files and output files.

1. SIDSTAR1_ING_DCL.COM - a VAX DCL Command Procedure

This Command Procedure runs the following COBOL programs which identifies the difference between the SIDS and STARS procedure names stored in the IAP tables, versus the SIDS and STARS procedure names stored in the DAFIF7 tables

COBOL Programs: **PROJSTAR_ING.SCB**
PROJSID_ING.SCB

2. PROJSTAR_ING.SCB

Inputs:

- **stars2.dat**

Outputs:

- **starfile.dat**
- **except-file1.dat**

Tables Accessed:

- acb_ss, iap_star
- acb_ap
- dafif7_arpt_arpt
- acb_fa, acb_na
- acb_rn
- acb_an
- iap_airport
- iap_city
- iap_starapt
- acb_ss tables.

3. PROJSID_ING.SCB

Inputs:

- **dp2.dat**

Outputs:

- **dpfile.dat**
- **except-file2.dat**

Tables Accessed:

- acb_ss
- iap_sid
- acb_ap
- dafif7_arpt_arpt
- acb_fa
- acb_na
- acb_rn
- acb_an
- iap_airport
- iap_city
- iap_sidapt

4. Data Structures

Data structures for these tables in Ingres can be found in the file **CARS_TABLE_STRUCTURES_INGRES.DAT** and for Oracle **CARS_TABLE_STRUCTURES_ORACLE.DAT.**

Task 8.5 Readme.doc

This document will describe what files, programs, tables and other relevant information required to understand the deliverable for paragraph 8.5 of the VAX to Unix SOW. The zip file contains a description of the table structures for the CARS application for both the Ingres and Oracle databases. Copies of the COBOL programs are included as well as input data files and output files.

1. EXP4FILE_ING.COM - a VAX DCL Command Procedure

This Command Procedure allows users to run either or both of two COBOL programs to update the AIS tables with route ID, sequence number, procedure name, and transition points from the STARS4, and DP4 flat files.

COBOL Programs: **SID_EXP4FILE_ING.SCB**
STAR_EXP4FILE_ING.SCB

2. SID_EXP4FILE_ING.SCB

Inputs:

- **dp4.dat**

Outputs:

- **dp_exp4file.dat**

Tables Accessed:

Table Read From

- AIS_SD_NAME

Table inserted into:

- AIS_SD_EXP4FILE

3. STAR_EXP4FILE_ING.SCB

Inputs:

- **stars4.dat**

Outputs:

- **stars_exp4file.dat**

Tables Accessed:

Table Read From

- **AIS_SS_NAME**

Table inserted into:

- **AIS_SS_EXP4FILE**

4. Data Structures

Data structures for these tables in Ingres can be found in the file **CARS_TABLE_STRUCTURES_INGRES.DAT** and for Oracle **CARS_TABLE_STRUCTURES_ORACLE.DAT.**

Task 8.6 Readme.doc

This document will describe what files, programs, tables and other relevant information required to understand the deliverable for paragraph 8.6 of the VAX to Unix SOW. The zip file contains a description of the table structures for the CARS application for both the Ingres and Oracle databases. Copies of the COBOL programs are included as well as input data files and output files.

1. INS_DACS_RPT.COM - a VAX DCL Command Procedure

This Command Procedure allows users to run two SQL routines to populate the AIS Departure and Arrival DACS tables with composite arrival and departure data retrieved from various other AIS tables. This is done as a prerequisite of paragraph 8.7 of the SOW, which generates DACS products.

SQL Routines: **ins_sd_dacs_rpt.sql**
ins_ss_dacs_rpt.sql

2. ins_sd_dacs_rpt.sql

This routine pulls data from the **ais_sd_stapt** and **ais_sd_exp4file** tables, and inserts data into the **ais_sd_dacs_rpt** table.

3. ins_ss_dacs_rpt.sql

This routine pulls data from the **ais_ss_stapt** and **ais_ss_exp4file** tables, and inserts data into the **ais_ss_dacs_rpt** table

4. Data Structures

Data structures for these tables in Ingres can be found in the file **CARS_TABLE_STRUCTURES_INGRES.DAT** and for Oracle **CARS_TABLE_STRUCTURES_ORACLE.DAT.**

Task 8.7 Readme.doc

This document will describe what files, programs, tables and other relevant information required to understand the deliverable for paragraph 8.7 of the VAX to Unix SOW. The zip file contains a description of the table structures for the CARS application for both the Ingres and Oracle databases. Copies of the COBOL programs are included as well as input data files and output files.

1. CRT_SS_DACS.COM - a VAX DCL Command Procedure

This Command Procedure allows users to invoke two Ingres Report-Writer routines. These routines pull data from the **ais_ss_dacs_rpt** and **ais_sd_dacs_rpt** tables, and produce the output files **DPAPT.DAT** and **STARSAPT.DAT** (aka DACS6, and DACS7).

These two report writer routines will have to be replaced with something comparable in the Oracle/Unix environment.

Ingres Report-Writer Routines: **AIS_DACS6.RW**
AIS_DACS7.RW

4. Data Structures

Data structures for these tables in Ingres can be found in the file **CARS_TABLE_STRUCTURES_INGRES.DAT** and for Oracle **CARS_TABLE_STRUCTURES_ORACLE.DAT.**

VAX – Unix Communication RFQ Question Answers

1. Is there a formal test plan with scripted tests and expected results? IF not, how will we test our work?
    a. The FAA staff will assist in the testing
    b. The output files in the new solution will be compared to outputs of the system on the VAX 4300.

2. Will you provide us access to a VMS baseline reference system to identify and correct defects?
    a. Yes, a test VMS reference system will be made available in conjunction with FAA staff to help identify defects.

3. What is the format and templates for the required reports and documentation?
    a. All reporting templates will be provided by the FAA upon execution of project.

4. How many DCL scripts?
    a. 5

5. How many COBOL programs?
    a. 6

6. Approximately how many tables?
    a. Approximately 52
    b. Table structures for all relevant tables are included in .zip files.

7. What languages are involved in the project besides COBOL?
    a. SQL
    b. Ingres Report Writer – to be replaced with something similar in Oracle.

8. Approximate number of relevant files?
    a. 32

9. Approximate number of lines of code?
    a. Relevant code is included in .zip files.

10. Which version of VMS?
    a. V6.2

11. Which Version of COBOL Compiler?
    a. COBOL 054.RELEASE NOTAES VAX COBOL V5.4 January 28, 1997

12. Approximate size databases?
    a. 1.3 GB

13. Approximate total size of relevant VMS flat files?
    a. 20 MB
    b. Relevant flat files are included in the in respective .zip files.